

## **405 KAR 30:370. Disposal of excess spoil materials and spent shale.**

RELATES TO: KRS 350.600

STATUTORY AUTHORITY: KRS 151.125, 224.033, 350.028, 350.050, 350.600

NECESSITY, FUNCTION, AND CONFORMITY: KRS 350.600 requires the Environmental and Public Protection Cabinet to develop administrative regulations for oil shale operations to minimize and prevent their adverse effects on the citizens and the environment of the Commonwealth. This administrative regulation sets forth specific requirements for the location of areas used for the disposal of excess spoil materials and spent shale and the design, construction, and inspection of fill structures composed of such materials.

Section 1. General Requirements. (1) Spoil and spent shale not disposed of in the mine workings shall be transported and placed in designated disposal areas within a permit area in a manner approved by the cabinet. The spoil and spent shale shall be placed in a controlled manner to ensure:

(a) That leachate and surface run-off from the fill will not degrade surface or groundwaters or exceed the effluent limitations of 405 KAR 30:320;

(b) Stability of the fill; and

(c) That the land mass designated as the disposal area is suitable for reclamation and revegetation compatible with the natural surroundings.

(2) The fill shall be designed using recognized professional standards, certified by a registered professional engineer, and approved by the cabinet.

(3) Vegetative and organic materials shall, either progressively or in a single operation, be removed from the disposal area and the topsoil shall be removed, segregated, and stored or replaced under 405 KAR 30:290. If approved by the cabinet, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

(4) All surface drainage from the undisturbed area above the fill shall be diverted away from the fill. Diversion design shall conform with the requirements of 405 KAR 30:310. All disturbed areas, including diversion ditches that are not riprapped, shall be vegetated upon completion of construction.

(5) The disposal areas shall be located on the most moderately sloping and naturally stable areas available as approved by the cabinet. Slope protection shall be provided to minimize surface erosion at the site. If such placement provides additional stability and prevents mass movement, fill materials suitable for disposal shall be placed upon or above a natural terrace, bench, or berm.

(6) The spoil and spent shale shall be transported and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and prevent mass movement, covered, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and ensure a long-term static safety factor of one and three-tenths (1.3).

(7) A minimum of four (4) feet of nontoxic and nonacid forming material shall be placed on the final layer of spent shale. In addition, the cabinet may require an impermeable cover between the final layer of spent shale and the four (4) feet of nontoxic and nonacid forming material. Greater depths may be specified by the cabinet if deemed necessary. This four (4) foot cover does not include the topsoil required in 405 KAR 30:290.

(8) The final configuration of the fill must be suitable for proposed postmining land uses approved in accordance with 405 KAR 30:220, except that no impoundments shall be allowed on the completed fill, and no depressions shall be allowed on the completed fill unless they are determined by the cabinet to have no potential adverse effect on the stability of the fill and to have no potential for interference with the approved postmining land use.

(9) Fills shall not be constructed in the 100-year flood plain of any perennial stream. A stream

channel may not be changed to circumvent this requirement.

(10) Terraces may be utilized to control erosion and enhance stability.

(11) Where the natural land slope in the disposal area exceeds 1v:2.8h (thirty-six (36) percent), or such lesser slope as may be designated by the cabinet based on local conditions, keyway cuts (excavations to stable bedrock) or rock toe buttresses shall be constructed to stabilize the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed to determine the size of rock toe buttresses and keyway cuts.

(12) The fill shall be inspected for stability by a registered engineer or other qualified person under the direct supervision of the responsible registered professional engineer experienced in the construction of earth and rockfill embankments at least monthly throughout construction and during the following critical construction periods: removal of all organic material and topsoil; placement of underdrainage systems; installation of surface drainage systems; placement and compaction of fill materials; and revegetation. The responsible registered professional engineer shall provide to the cabinet a certified report within two (2) weeks after each inspection that the fill has been constructed as specified in the design approved by the cabinet. A copy of the report shall be retained at the mine site.

(13) Leachate ponds shall be constructed below all spent shale disposal areas at locations approved by the cabinet. Ponds shall be sized to contain all leachate from excess spoil and spent shale disposal areas. Leachate ponds shall be constructed in accordance with the requirements of 405 KAR 30:340.

(14) Oil shale processing wastes and spent shale shall not be disposed of in head-of-hollow or valley fills with excess spoil unless specific approval is granted by the cabinet.

(15) If the disposal area contains springs, natural or manmade watercourses, or wet-weather seeps, an underdrain system consisting of durable rock shall be constructed from the wet areas in a manner that prevents infiltration of the water into the spoil material. The underdrain system shall be protected by an adequate filter and shall be designed and constructed using standard geotechnical engineering methods.

(16) The foundation and abutments of the fill shall be stable under all conditions of construction and operation. Sufficient foundation investigation and laboratory testing of foundation materials shall be performed in order to determine the design requirements for stability of the foundation. Analyses of foundation conditions shall include the effect of underground mine workings, if any, upon the stability of the structure.

Section 2. Additional Requirements for Spent Shale Disposal. (1) At a minimum, the permit applicant shall conduct tests to determine the active and potential acid levels of spent shale and an EP toxicity test to identify toxic contaminants. The results of these tests shall be submitted to the cabinet prior to receiving a permit. The cabinet will use the results of these tests to determine if the proposed handling method for spent shale in conjunction with excess spoil will fulfill the requirements of Section 1(1) of this administrative regulation. The cabinet may require additional tests as necessary to make this determination.

(2) If the cabinet determines that the proposed handling method for spent shale in combination with excess spoil will not adequately fulfill the requirements of Section 1(1) of this administrative regulation spent shale shall be handled according to the provisions of 405 KAR 30:360. Excess spoil shall be handled in accordance with the provisions of Section 1 of this administrative regulation excluding subsections (7) and (13) of that section.

(3) Spent shale shall be cooled to a temperature approved by the cabinet, prior to disposal.

Section 3. Valley Fills and Head-of-hollow Fills. Disposal of excess spoil in valley fills and head-of-hollow fills shall meet all requirements of Section 1 of this administrative regulation and the addition-

al requirements of this section, except as provided in Section 2 of this administrative regulation.

(1) The fill shall be designed to attain a long-term static safety factor of one and three-tenths (1.3) based upon data obtained from subsurface exploration, geotechnical testing, foundation design, and accepted engineering analyses.

(2) A subdrainage system for the fill shall be constructed in accordance with the following:

(a) A system of underdrains constructed of durable rock shall meet the requirements of paragraph (d) of this subsection and:

1. Be installed along the natural drainage system;
2. Extend from the toe to the head of the fill; and
3. Contain lateral drains to each area of potential drainage or seepage.

(b) A filter system to insure the proper functioning of the rock underdrain system shall be designed and constructed using standard geotechnical engineering methods.

(c) In constructing the underdrains, no more than ten (10) percent of the rock may be less than twelve (12) inches in size and no single rock may be larger than twenty-five (25) percent of the width of the drain. Rock used in underdrains shall meet the requirement of paragraph (d) of this subsection. The main underdrain shall be sized so as to function properly under all probable conditions and must meet the approval of the cabinet.

(d) Underdrains shall consist of nondegradable, nonacid or toxic forming rock such as natural sand and gravel, sandstone, limestone, or other durable rock that will not slake in water and will be free of coal, clay or shale.

(3) Spoil shall be transported and placed in a controlled manner and concurrently compacted as specified by the cabinet, in lifts no greater than four (4) feet. The cabinet may require lifts of less than four (4) feet in order to:

- (a) Achieve the densities designed to ensure mass stability;
- (b) Prevent mass movement;
- (c) Avoid contamination of the rock underdrain or rock core; and
- (d) Prevent formation of voids.

(4) Surface water run-off from the area above the fill shall be diverted away from the fill and into stabilized diversion channels designed to pass safely the run-off from a 100-year, twenty-four (24) hour precipitation event or larger event specified by the cabinet. Surface run-off from the fill surface shall be diverted to stabilized channels off the fill which will safely pass the run-off from a 100-year, twenty-four (24) hour precipitation event. Diversion design shall comply with the requirements of 405 KAR 30:310, Section 1(2).

(5) The tops of the fill and any terrace constructed to stabilize the face shall be graded no steeper than 1v:20h (five (5) percent). The vertical distance between terraces shall not exceed fifty (50) feet.

(6) Drainage shall not be directed over the outslope of the fill.

(7) The outslope of the fill shall not exceed 1v:2h (fifty (50) percent). The cabinet may require a flatter slope.

(8) The cabinet may approve other methods of design and construction if demonstrated by the applicant using sound engineering principles that such design and construction meets or exceeds the requirement of this administrative regulation.

Section 4. Other Disposal Requirements. The cabinet may require other measures to ensure the protection of fish and wildlife, water, vegetation, and other environmental resources of the area as well as public health and safety. (9 Ky.R. 986; eff. 10-5-1983; TAm eff. 8-9-2007; Crt eff. 7-3-2018.)